

# THE VASCULAR FLORA OF THE LAGUNA DE ALEGRÍA, A NATIONAL MONUMENT IN THE CRATER OF TECAPA VOLCANO, EL SALVADOR

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## ABSTRACT

Extreme deforestation and overuse of resources have devastated El Salvador's natural environment while continued population pressure underscores the need for the few remaining natural areas to be studied and preserved. The 150-ha Monumento Nacional Laguna de Alegría is located inside the crater of Tecapa Volcano in southeastern El Salvador and includes both primary and disturbed subtropical forest, steep and rocky crater walls, and a sulfuric lake in the basin. The flora of the Laguna de Alegría was surveyed from December 1998 to November 1999 and results of this survey were combined with reports from other collectors and published reports to compile a list of 447 specific and 2 hybrid taxa representing 106 families. The taxa are cataloged in an annotated list that includes collection number and herbarium of deposit. Exotic species are designated. *Trigonospermum annum* McVaugh & Lask. is a new report for El Salvador.

## RESUMEN

La deforestación extrema y la sobreexplotación de recursos han devastado la naturaleza de El Salvador, mientras la incesante presión demográfica subraya la necesidad de estudiar y preservar las restantes áreas naturales. El Monumento Nacional Laguna de Alegría mide 150 hectáreas y está ubicado dentro del cráter del Volcán Tecapa en el sur-este de El Salvador. El parque incluye bosque subtropical primario y perturbado, paredes volcánicas rocosas y empinadas, y una laguna sulfúrica en la cuenca. Se identificó la flora de la Laguna de Alegría desde diciembre de 1998 hasta noviembre de 1999 y se combinaron los resultados del estudio con los reportes de otros colectores y reportes publicados para compilar un listado de 447 taxa específicos y 2 híbridos. Estas representan 106 familias. Los taxa fueron catalogados en un listado anotado que incluye el número de la colección y del herbario, y se designaron las especies exóticas. Es el primer reporte de *Trigonospermum annum* McVaugh & Lask. en El Salvador.

## INTRODUCTION

The Republic of El Salvador, with a land area of only 21,000 km<sup>2</sup> and a population of more than 6 million, is the smallest and most densely crowded of the Central American countries. Extreme population pressure has devastated El Salvador's environment, causing the loss of 97% of the country's original forest (Benitez 1996 unpublished, cited from Berendsohn 1991) and forcing farmers to convert ever more forest and marginal land to crop production. Recent estimates of forest cover indicate that only 130,000 ha, or 6.1% of the national territory, is



now covered by natural forest (DIPRAT 1997), most of which is composed of small, relictual parcels.

The government of El Salvador recognizes the urgency of protecting the few remaining forests and forest fragments in the country and has identified 125 natural areas to form the "Sistema de Areas Naturales Protegidas" (<http://www.marn.gob.sv/sia/anp.htm>). These natural areas are all relatively small, but are of supreme importance as the country's last refuges for wildlife and gene pools that could provide the primary materials for reforestation and regeneration of other areas. However, there is no infrastructure to administer most of these areas; only three areas have legal protection by legislative or executive decree; and nearly all of them are still exploited for firewood, grazing lands, and for squatter's homesteads. Moreover, there is an almost complete lack of basic biological information about these areas and few in-country resources to gather this information. Apart from El Imposible National Park, none of El Salvador's protected areas has previously had a complete floral survey. While biologists from developed countries tend to disregard El Salvador in favor of studying other countries with better preserved and more extensive wild areas, the very precarious ecological situation in El Salvador should make it a high priority for study so that the natural resources still intact can be managed and preserved in the most effective manner possible.

#### THE LAGUNA DE ALEGRÍA

The Laguna de Alegría is a tiny but spectacular natural area in the crater of the extinct Tecapa Volcano in the department of Usulután, and is the only national monument proposed within the Salvadoran system of protected areas. Tecapa is located at 13°29'40" N latitude and 88°29'43" W longitude (Fig. 1) and rises to a height of 1599 m. It is the second largest peak in the Chinameca chain of volcanoes that dominates much of the southeastern corner of El Salvador and forms part of the Central American chain that extends from southwest Mexico, through Guatemala, El Salvador, Nicaragua, Costa Rica and Panama.

The interior of the Tecapa crater is 150 ha and is comprised of an emerald-green, sulfuric lake in the caldera surrounded by natural forest. The ecological value of this small forest is immense in this heavily deforested country and the natural beauty of the lake and sheer crater walls make for a striking setting.

There are no historical records of volcanic activity, though there are emissions of steam mixed with volcanic gases on the southwest side of the lake. The gaseous emissions, which have a high concentration of sulfur compounds, have contributed to the low pH of soils in much of the basin of the caldera and to the extreme acidity of the lake. The sulfur compounds give the lake a characteristic emerald green color and have bleached the beach and lake substrate white. It has been suggested that only algae and diatoms are able to live permanently in the extreme conditions of the water (SACDEL 1997), but exoskeletons of drag-





FIG. 1. Map of Central America showing the approximate location of the Laguna de Alegría, El Salvador.

only nymphs have been observed (Williams, pers. obs.) and a species of *Eleocharis* (Cyperaceae) has been reported growing in the margins of the lake (Fassett 1952).

Holdridge (1975) classifies the area in and around the summit of Tecapa Volcano as very humid subtropical forest and much of the forest is primary growth, especially those parts located on the steep inner slopes. Local residents report that some of the valuable timber species have been removed from the more accessible areas of the forest in the basin, and three areas of the forest were cleared and planted in coffee: one in a small area of the basin, now abandoned, and two others, on the northeast and northwest slopes, both still in cultivation. The inner walls of three sides of the crater are a nearly vertical 300 m tall making them inaccessible without specialized climbing equipment and only there has the forest been left completely undisturbed by humans.

The outer slopes of the volcano are not officially included in the protected area, and what parts have not been planted in coffee have been deforested for firewood. The coffee grown in plantations on the outer slopes is mixed with



shade trees, thereby offering some protection for the buffer zone. Unfortunately, the coffee plantations do not have the density of vegetation in natural forest and some recently replanted areas have come so close to the edge of the steep inner slope that severe erosion and landslides have resulted from the loss of cover (Williams, pers. obs.).

The Laguna de Alegría is currently being managed by the Asociación de Desarrollo Comunal Alberto Masferrer (ADESCAM), a local organization created in 1995 and given charge of the area for development for ecotourism and recreation by the municipal government. The area has become popular as a tourist destination due to promotion and development by ADESCAM on a national scale. However, the balance between conservation and tourism is often difficult, especially in the case of the Laguna de Alegría because the amphitheater-like setting of the interior of the crater amplifies the presence of humans in the natural area. This study was undertaken to provide ADESCAM with part of the basic biological information necessary to write a management plan for sustainable use of the area.

#### METHODS

The majority of the species listed in this survey are documented by herbarium vouchers we collected in the Laguna de Alegría between 9 Dec 1998 and 20 Nov 1999. Most of the vouchers were taken from the basin of the crater, e.g., the beaches of the lake, the edges of the forest along the sides of the road, and those parts of the forest accessible from the basin. Some collections were made from the top of the rim, but most of the vegetation of the cliff areas of the crater is not accounted for in this survey because we did not attempt to scale the steep slopes.

The samples were pressed and dried and sent to the herbarium at the Jardín Botánico La Laguna (LAGU) in San Salvador where we later identified them. Major references used to identify specimens include Davidse et al. (1995) and Standley and Steyermark (1960).

At LAGU we encountered specimens collected in the 1960s and 1970s in the Laguna de Alegría by the German botanist Hans Winkler. We revised those reports and added them to ours.

We also added a list of species collected by Alex Monro that are vouchered at The Natural History Museum in London (BM). Unfortunately, we were not able to visit BM and not all of Monro's collections had been identified to species at the time of this report. More information may be available when he completes his work.

In addition to reporting herbarium collections, we included reports of plants from the Laguna de Alegría in two previous publications: Fritz Hamer's book *Las Orquídeas de El Salvador* (1974) and a descriptive survey of tree species of the Laguna de Alegría made by the Salvadoran dendrologist Maria Luisa



Reyna de Aguilar (SACDEL 1997). Unfortunately, Hamer did not publish the sources of his reports and Reyna de Aguilar took only four voucher specimens during her survey, so it is not possible to verify their identifications.

Edy Montalvo (pers. com.), former curator of the herbarium of the Universidad de El Salvador (ITIC), made several collecting trips to the Laguna de Alegría in the 1970s. We had hoped to peruse ITIC's collections and add Montalvo's reports and any other specimens from the Laguna de Alegría that might be housed there, but due to a shortage of staffing, we were never able to gain permission to ITIC. It would be valuable to revise ITIC's collections and add them to this list.

After the identification phase was completed, we returned to the Laguna de Alegría and noted another 17 species that had not been collected in the previous year nor noted by other authors. We also verified an older collection of 100 woody species made in 1998 for ADESCAM.

It should be noted that we also collected non-vascular plants, i.e., mosses and lichens, during the 1999 survey. Those vouchers were deposited in LAGU as well, but since materials and expertise are not yet available to identify them, they are not included in this list.

#### RESULTS AND DISCUSSION

We compiled a list of 821 voucher specimens and visual reports to identify a total of 447 species and 2 hybrids of vascular plants from 319 genera and 106 families from the Laguna de Alegría (Table 1). Of the two hybrids reported in our list, one is a natural hybrid orchid, the other, the artificial hybrid that creates the many varieties of bananas and plantains. Neither of the parent species for either of these two hybrids are known from the Laguna de Alegría.

The most important families in terms of numbers of species present are Asteraceae (54 species), Fabaceae (41 species), Poaceae (34 species), and Orchidaceae (29 species and 1 hybrid). The families Asteraceae and the Poaceae both tend to be composed of pioneer and secondary vegetation specialist species and most of the species from these families found in the Laguna de Alegría were found along the roadsides, in landslide zones, and on the beaches of the laguna. Many of the species of Poaceae collected in the Laguna de Alegría are naturalized exotics. The high numbers of species in these families indicates the large amount of disturbance in many parts of the protected area.

The orchid species found in the Laguna de Alegría, on the other hand, tend to be primary forest species, and none are exotic. All of the orchids we found were in the forest or undisturbed areas of the cliffs with the exception of just two terrestrial species found in open areas. The large number of species of orchids, therefore, supports the notion that the less accessible parts of the forest have been intact and undisturbed for a long time.

The hybrid orchid, *Mormodes* × *salvadorensis* Hamer & Garay, is a natural



TABLE 1. Statistical summary by taxa of the flora of the Laguna de Alegría.

	Families	Genera	Species	Hybrids
Ferns and fern allies	13	22	34	0
Gymnosperms	3	3	4	0
Monocots	12	69	99	2
Dicots	78	225	310	0
Total	106	319	447	2

hybrid first reported by Hamer (1974) from two locations in El Salvador. One of these locations was the Laguna de Alegría, but *M. × salvadorensis* was not found in our 1999 survey. It is possible that it has become extirpated in the 25 intervening years. However, neither of the two parent species was found either by Hamer or by us, though they most likely exist or once existed within the bounds of the park. This fact suggests that there probably are more orchid species present which have not been recorded, a fact which is very likely considering the difficulty of encountering epiphytic orchids in the dense forest and the steep cliffs of the crater.

We found 36 exotic species in the Laguna de Alegría, making up just 8.2% of the total number of species. In comparison with a national figure of 28%, the percentage of exotic taxa in the Laguna de Alegría is very small, a fact that serves as another indicator that the area is still in a very natural state. Many of the exotics found are plants cultivated in the coffee plantations and around the margins of the lake, but nine of the species have been introduced intentionally by ADESCAM for ornamental purposes in recreational areas or for “reforestation” in areas where natural growth would have occurred. Apparently only eight species have invaded under their own power: seven grasses and “higuero” or “castor bean” (*Ricinus communis* L. Euphorbiaceae). These eight plants are all aggressive colonizers and have taken advantage of man-made disturbances such as roads and trails and other clearings to spread to new locations. One species, “frijol de palo” or “pigeon pea” (*Cajanus cajan* (L.) Millsp. Fabaceae), is of uncertain invasion status, being a plant that is widely cultivated for its edible beans, but also widely naturalized and an aggressive colonizer.

The distribution status of the majority of El Salvador’s flora is poorly known, and there is no official list of threatened or endangered species for the country. At least one species collected in this survey, *Cibotium regale* Verschaff. & Lem. Dicksoniaceae, is endangered throughout its habitat (Davidse et al. 1995). The only individual of *Bixa orellana* L. Bixaceae in the Laguna de Alegría was destroyed by a landslide in 1998. However, *B. orellana* is common throughout most of El Salvador.

Despite the poor knowledge of El Salvador’s flora, we found relatively few



new reports in our survey. *Trigonospermum annum* McVaugh & Lask. Asteraceae is the only verified new report for El Salvador. *Peperomia cf. liebmanii* C. DC. Piperaceae and *Tillandsia cf. kammi* Rauh Bromeliaceae, if confirmed as such, will also be new reports.

The total species count is relatively large for such a small area, especially when one considers that more extensive studies would most likely provide new reports and that the cliffs of the crater have never been surveyed. The total number of species registered for El Salvador is 4670 (Reyna de Aguilar 1995), meaning that the Laguna de Alegría, with an areal extent of less than 0.005% of the land area of the country, harbors 9.4% of the country's plant species. It is evident that the continued preservation of the tiny Laguna de Alegría is crucial to maintaining El Salvador's plant diversity.

#### APPENDIX

##### Annotated list of the vascular species of the Laguna de Alegría

Collectors/authors of reports: DW: Denise Williams and Rudys Herrera, AM: Alex Monro, FH: Fritz Hamer, JBL/Author: specimen housed at the Jardín Botánico La Laguna, MLRA: Maria Luisa Reyna de Aguilar, ADESCAM: collection of the Asociación de Desarrollo Comunal Alberto Masferrer.

\* refers to introduced exotic species, \*\* refers to naturalized exotic species, † extinct.

*Note.*—At the end of each entry with multiple collections follows a list of herbaria where a duplicate of at least one of the collections was sent. This does not mean to imply that *each* herbarium has a duplicate of *every* collection listed for that entry. LAGU was the main repository for the specimens we collected and it retained one duplicate of all our collections.

#### DIVISION LYCOPODIOPHYTA

##### SELAGINELLACEAE

*Selaginella* sp., DW

#### DIVISION PTERIDOPHYTA

##### ADIANTACEAE

*Adiantum princeps* T. Moore, DW136 (B, LAGU, MO)

*Anogramma leptophylla* (L.) Link, DW424 (LAGU)

*Cheilanthes angustifolia* Kunth, DW301 (LAGU, MO)

*Cheilanthes kaulfussii* Kunze, DW348 (LAGU)

*Mildella intramarginalis* (Kaulf. ex Link) Trevis., DW57, DW60 (B, EAP, LAGU, MO)

*Pityrogramma calomelanes* (L.) Link, DW14, DW297 (LAGU)

##### ASPLENIACEAE

*Asplenium auriculatum* Sw., DW53, DW413 (LAGU, MO)

*Asplenium cuspidatum* Lam., DW52, DW137, DW299 (B, LAGU, MO)

*Asplenium formosum* Willd., DW315, DW503 (LAGU, MO)

*Asplenium* sp., DW139, DW427 (LAGU)

##### BLECHNACEAE

*Blechnum cf. occidentale* L., DW55 (LAGU, MO)

*Blechnum glandulosum* Kaulf. ex Link, DW54 (LAGU, MO)

##### DAVALIACEAE

*Nephrolepis multiflora* (Roxb.) F.M. Jarrett ex C.V. Morton, DW51 (B, EAP, LAGU, MO)

##### DENNSTAEDTIACEAE

*Pteridium caudatum* (L.) Maxon, DW521 (LAGU)



**DICKSONIACEAE**

*Cibotium regale* Verschaff. & Lem., DW471 (B, LAGU, MEXU, MO)

**DRYOPTERIDACEAE**

*Polystichum muricatum* (L.) Fée, DW58 (LAGU, MO)  
*Tectaria mexicana* (Fée) C.V. Morton, DW132 (LAGU, MO)

**GLECHENIACEAE**

*Gleichenia bifida* (Willd.) Spreng., DW141 (LAGU, MO)

**HYMENOPHYLLACEAE**

*Trichomanes hymenophylloides* Bosch, DW247 (B, LAGU, MO)  
*Trichomanes krausii* Hook. & Grev., DW380 (LAGU)

**POLYPODIACEAE**

*Campyloneurum angustifolium* (Sw.) Fée, DW455 (LAGU)  
*Pecluma alfredii* (Rosenst.) M.G. Price, DW56 (LAGU, MO)  
*Phlebodium pseudoaureum* (Cav.) Lellinger, DW442 (LAGU)  
*Pleopeltis angusta* Humb. & Bonpl. ex Willd., DW129 (B, LAGU, MO)  
*Polypodium furfuraceum* Schldtl. & Cham., DW300 (LAGU)  
*Polypodium plumula* Humb. & Bonpl. ex Willd., DW298 (LAGU)  
*Polypodium polypodioides* (L.) Watt var. *polypodioides*, DW50, DW243, DW436 (B, LAGU, MO)

**SCHIZAEACEAE**

*Anemia hirsuta* (L.) Sw., DW217, DW354 (B, LAGU, MO)  
*Anemia oblongifolia* (Cav.) Sw., DW140 (B, LAGU, MO)  
*Anemia* cf. *phyllitidis* (L.) Sw., DW127 (LAGU)  
*Anemia speciosa* C. Presl., DW131, DW302 (LAGU, MO)

**THELYPTERIDACEAE**

*Thelypteris oligocarpa* (Humb. & Bonpl. ex Willd.) Ching, DW59, DW237 (LAGU, MO)  
*Thelypteris puberula* (Baker) C.V. Morton. var. *puberula*, DW261 (LAGU)

**DIVISION CONIFEROPHYTA****ARAUCACEAE**

\**Araucaria heterophylla* (Salisb.) Franco, DW

**CUPRESACEAE**

\**Cupressus lusitanica* Mill., DW425 (LAGU)

**PINACEAE**

\**Pinus caribaea* Morelet, DW  
*Pinus oocarpa* Schiede ex Schldtl., ADESCAM

**DIVISION MAGNOLIOPHYTA****MONOCOTYLEDONS****AGAVACEAE**

\**Cordyline* sp., DW  
*Furcraea* sp., DW  
 \**Yucca guatemalensis* Baker, ADESCAM

**ARACEAE**

*Syngonium macrophyllum* Eng., DW631 (LAGU)  
 \**Zantedeschia aethiopica* (L.) Spreng., DW626 (LAGU)

**ARECACEAE**

*Chamaedora* sp., DW579 (LAGU)

**BROMELIACEAE**

\**Ananas comosus* (L.) Merr., DW  
*Pitcairnia heterophylla* (Lindl.) Beer, DW118, DW528 (LAGU)  
*Pitcairnia imbricata* (Brongn.) Regel, DW337 (LAGU)  
*Tillandsia butzii* Mez, DW100 (B, LAGU, MO)  
*Tillandsia caput-medusae* E. Morren, DW530 (LAGU)  
*Tillandsia fasciculata* Sw., DW338 (LAGU)  
*Tillandsia* cf. *kammi* Rauh, DW412, DW529 (LAGU)  
*Tillandsia vicentina* Standl., DW254 (LAGU)

**COMMELINACEAE**

*Commelina diffusa* Burm. f., DW151, DW190, DW327, DW331 (LAGU, MO)  
*Commelina erecta* L., DW328 (LAGU, MO)  
*Commelina leiocarpa* Benth., DW193 (LAGU)  
*Commelina tuberosa* L., DW382 (LAGU)  
*Gibasis pellucida* (M. Martens & Galeotti) D.R. Hunt, DW180 (LAGU)  
*Tinantia longipedunculata* Standl. & Steyerl., DW333 (LAGU)  
*Tradescantia zanonii* (L.) Sw., DW155, DW519 (LAGU)  
*Tripogandra montana* Handl., DW322 (LAGU, MO)

**CYPERACEAE**

*Bulbostylis tenuifolia* (Rudge) J.F. Macbr., DW206, DW390 (B, LAGU, MO)



*Cyperus aggregatus* (Willd.) Endl., DW221, DW335  
(B, LAGU, MO)

*Cyperus amabilis* Vahl, DW222 (LAGU)

*Cyperus hermaphroditus* (Jacq.) Standl., DW128,  
DW134, DW149 (LAGU, MO)

*Cyperus laxus* Lam., DW195 (LAGU, MO)

*Cyperus tenerrimus* J. Presl. & C. Presl., DW496  
(LAGU)

*Eleocharis filiculmis* Kunth, DW274, AM3025 (BM,  
LAGU, MO)

*Rhynchospora contracta* (Nees) J. Raynal, DW318  
(LAGU)

*Torulium odoratum* (L.) S.S. Hooper, DW334 (B,  
LAGU, MO)

### DIOSCOREACEAE

*Dioscorea mexicana* Scheidw., DW381, DW520 (B,  
LAGU, MO)

### HYPOXIDACEAE

*Hypoxis decumbens* L., DW377 (LAGU)

### IRIDACEAE

*Sisyrinchium tinctorium* Kunth, DW623 (LAGU)

### LILIACEAE

*Bomera* sp., DW619 (LAGU)

*Echeandea skinnerii* (Baker) Cruden, DW290 (B,  
LAGU, MO)

### MUSACEAE

\**Musa x paradisiaca* L. (pro. sp.), DW

### ORCHIDACEAE

*Bletia purpurea* (Lam.) A. DC., DW244, DW500,  
DW516 (LAGU, MO)

*Cattleya aurantiaca* (Batem.) P.N. Don, DW150  
(LAGU)

*Cranichis apiculata* Lindl., FH

*Cycnoches egertonianum* Batem., JBL142 (LAGU)

*Deiregyne hemichrea* (Lindl.) Schltr., DW43,  
DW527, FH (LAGU, MO)

*Encyclia baculus* (Rchb.f.) Dressler & G.E. Pollard,  
DW487 (LAGU)

*Encyclia ochracea* (Lindl.) Dressler, DW536 (LAGU)

*Epidendrum ciliare* L., DW387 (LAGU, MO)

*Govenia ciliilabia* Ames & Schweinf., JBL768/Win-  
kler (LAGU)

*Govenia liliacea* (La Llave & Lex.) Lindl., JBL386/  
Hamer, FH (LAGU)

*Govenia mutica* Rchb.f., DW391, FH (LAGU)

*Govenia utriculata* (Sw.) Lindl., FH

*Habenaria alata* Hook., DW347 (LAGU)

*Habenaria floribunda* Lindl., JBL793/Winkler, FH  
(LAGU)

*Hexadesmia cruriger* Batem. ex Lindl., DW248,  
DW404, DW501 (B, LAGU, MO)

*Hexadesmia micrantha* Lindl., DW414 (B, LAGU,  
MO)

*Isochilus amparoanus* Schltr., DW148, DW346,  
DW510 (LAGU)

*Laelia rubescens* Lindl., DW537 (LAGU)

*Lycaste sulfurea* Rchb.f., DW518, FH, JBL394, JBL842  
(B, K, LAGU, MO, SEL)

*Maxillaria variabilis* Batem. ex Lindl., DW246,  
DW403 (B, LAGU, MO)

*Mormodes x salvadorensis* Hamer & Garay, FH

*Pleurothallis quadrifida* (Lex.) Lindl., DW267,  
DW385, FH (LAGU, MO)

*Ponthieva* cf. *triloba* Schltr., DW340 (LAGU)

*Sarcoglottis rosulata* (Lindl.) P.N. Don, FH

*Sobralia macrantha* Lindl., DW384 (LAGU)

*Spiranthes* sp. I, DW252 (LAGU)

*Spiranthes* sp. II, DW379 (LAGU, MO)

*Stelis vestita* Ames, DW535 (LAGU)

*Trichopilia maculata* Rchb.f., FH

### POACEAE

*Aegopogon cenchroides* Humb. & Bonpl. ex Willd.,  
DW356 (B, LAGU, MO)

*Andropogon angustatus* (J. Presl) Steud., DW292  
(LAGU)

*Andropogon leucostachyus* Kunth, DW126 (B,  
LAGU, MO)

*Aristida capillacea* Lam., DW173 (B, K, LAGU, MO)

\*\**Arthraxon hispidus* (Thunb.) Makino var.  
*hispidus*, DW5, DW178 (B, LAGU, MO)

*Axonopus capillaris* (Lam.) Chase, DW314, DW523  
(LAGU)

*Chloris radiata* (L.) Sw., DW17 (LAGU, MO)

\*\**Cynodon dactylon* (L.) Pers., DW423 (LAGU)

*Digitaria ciliaris* (Retz.) Koeler, DW281, DW287,  
DW288, DW289 (B, LAGU, MO)

\*\**Eleusine indica* (L.) Gaertn., DW71, DW179,  
DW309 (B, LAGU, MO)

*Eragrostis hypnoides* (Lam.) Britton et al., DW512  
(B, EAP, K, LAGU, MO)

*Eragrostis mexicana* Davidse subsp. *mexicana*,  
DW220, DW294 (B, LAGU, MO)

\*\**Hyparrhenia rufa* (Nees) Stapf, DW70, DW108  
(LAGU, MO)

*Lasiacis procerrima* (Hack.) Hitchc., DW321  
(LAGU)



- \*\**Melinis minutifolia* P. Beauv., DW76, DW123, DW212 (LAGU, MO)  
*Muhlenbergia tenella* (Kunth) Trin., DW341, DW357, DW361 (B, LAGU, MO)  
*Oplismenus burmanii* (Vasey) McVaugh var. *nudicaulis*, DW133, DW352 (B, LAGU, MO)  
*Oplismenus hirtellus* (L.) Beauv., DW526 (LAGU)  
*Panicum arundinariae* Trin. ex E. Fourn., DW176 (LAGU)  
\*\**Panicum maximum* Jacq., DW293 (LAGU)  
*Panicum trichoides* Sw., DW199 (LAGU)  
*Panicum* sp., DW39 (K, LAGU, MO)  
*Paspalum candidum* (Humb. & Bonpl. ex Flüggé) Kunth, DW264, DW364 (LAGU, MO)  
*Paspalum clavuliferum* C. Wright, DW312 (LAGU)  
*Paspalum convexum* Humb. & Bonpl. ex Flüggé, DW185, DW219, DW313 (LAGU)  
*Paspalum costaricense* Mez, DW282, DW283 (LAGU)  
*Paspalum notatum* Flüggé, DW286, DW310 (LAGU, MO)  
*Paspalum paniculatum* L., DW284 (B, LAGU, MO)  
*Pennisetum complanatum* (Nees) Hemsl., DW514 (LAGU, MO)  
\*\**Rhynchelytrum repens* (Willd.) C.E. Hubb., DW61, DW311, DW479 (LAGU, MO)  
*Setaria parviflora* (Poir.) Kerguelen, DW291, DW360 (B, LAGU, MO)  
*Sporobolus indicus* (L.) R. Br., DW4, DW285 (B, K, LAGU, MO)  
cf. *Urochloa* sp., DW462 (LAGU, MO)  
undetermined sp., DW363, DW504 (LAGU, MO)

## DIVISION MAGNOLIOPHYTA DICOTYLEDONS

### ACANTHACEAE

- Blechum browneii* Juss., DW19 (LAGU)  
*Elytraria imbricata* (Vahl) Pers., DW65, DW120 (B, LAGU, MO, US)  
*Henrya insularis* Nees, DW153, DW459 (B, LAGU, MO)  
*Tetramerium nervosum* Nees, DW146 (B, LAGU, MO)

### ACTINIDACEAE

- Saurauia kegeliana* Schlttdl., DW565 (LAGU)

### AMARANTHACEAE

- Achyranthes indica* (L.) Mill., DW11, DW109 (B, LAGU, MO)

- Amaranthus spinosus* L., DW230 (LAGU)  
*Chamissoa altissima* (Jacq.) Kunth, DW256 (B, F, LAGU, MO)  
*Iresine calea* (Ibañez) Standl., DW26 (B, F, LAGU, MO)  
*Iresine diffusa* Humb. & Bonpl. ex Willd., DW20, DW42, DW46, DW69, DW355 (B, F, LAGU, MO)  
*Pleuropetalum sprucei* (Hook. f.) Standl., DW471 (LAGU)

### ANACARDIACEAE

- \**Mangifera indica* L., DW513 (LAGU)  
*Rhus terebinthifolia* Schlttdl. & Cham., DW453 (LAGU)  
*Spondias purpurea* L., ADESCAM

### ANNONACEAE

- Annona cherimola* Mill., DW434, AM3019 (BM, LAGU)  
*Annona diversifolia* Saff., DW629 (LAGU)  
*Annona holosericea* Saff., MLRA

### APIACEAE

- Spananthe paniculata* Jacq., DW345 (LAGU, MO)

### APOCYNACEAE

- Alstonia longifolia* (A. DC.) Pichon, ADESCAM  
\**Thevetia peruviana* (Pers.) K. Schum., DW551 (LAGU)

### ARALIACEAE

- Oreopanax xalapensis* (Kunth) Decne. & Planch., DW87 (LAGU)

### ARISTOLOCHIACEAE

- Aristolochia* sp., DW

### ASCLEPIADACEAE

- Gonolobus lasiostemma* (Hemsl.) Woodson, DW428 (LAGU, MO)

### ASTERACEAE

- Acmella alba* (L'Her.) R.K. Jansen, DW117, DW231 (B, K, LAGU, MO)  
*Ageratum conyzoides* L., DW125 (B, LAGU, MO)  
*Baccharis trinervis* Pers., DW78 (LAGU, MO)  
*Baccharis monoica* G.L. Nesom, DW116 (LAGU)  
*Bidens pilosa* L., DW200, DW303 (LAGU)  
*Bidens squarrosa* Kunth, DW25, DW27, DW228 (K, LAGU, MO)  
*Calyptocarpus wenlandii* Sch. Bip., DW415 (LAGU)  
*Chaptalia nutans* (L.) Pol., DW386 (LAGU, MO)  
*Chromolaena odorata* (L.) R.M. King & H. Rob., DW86 (LAGU)



- Conyza bonariensis* (L.) Cronquist, DW410, DW431 (LAGU)
- Coreopsis mutica* D.J. Crawford var. *microcephala*, DW81, DW441 (LAGU)
- Critonia daleoides* DC., DW112, DW250 (LAGU, MO)
- Critonia morifolia* (Mill.) R.M. King & H. Rob., DW277, DW463 (LAGU, MO)
- \**Dahlia imperialis* Roez. ex Ortgies, DW74 (B, LAGU, MO)
- Eclipta prostrata* (L.) L., DW326 (LAGU, MO)
- Elephantopus mollis* Kunth, DW68, DW207 (B, LAGU, MO)
- Elephantopus spicatus* B. Juss. ex Aubl., DW18 (B, K, LAGU, MO)
- Erechtites valerianaefolius* (Link ex Spreng.) DC., DW373 (LAGU, MO)
- Erigeron karvinskianus* DC., DW422, DW488 (LAGU)
- Fleischmanniopsis leucocephala* (Benth.) R.M. King & H. Rob., DW226 (LAGU)
- Galinsoga caracasana* (DC.) Sch. Bip., DW103 (LAGU, MO)
- Galinsoga urticifolia* (Kunth) Benth., DW419, DW421 (B, LAGU, MO)
- Jaegeria hirta* (Lag.) Less., DW191 (LAGU)
- Koanophyllon* cf. *standleyi* (Robinson) R.M. King & H. Rob., DW165 (B, LAGU, MO)
- Lasianthaea fruticosa* (L.) K.M. Becker, DW209 (LAGU)
- Melampodium divaricatum* (Rich. ex Pers.) DC., DW306, DW308, DW401 (B, LAGU, MO)
- Melampodium paniculatum* Gardner, DW115, DW305, DW307, DW323 (B, K, LAGU, MO)
- Melanthera nivea* (L.) Small, DW105 (B, K, LAGU, MO)
- Onoseris onoseroides* (Kunth) B.L. Rob., DW271 (LAGU)
- Otopappus glabratus* (J.M. Coult.) S.F. Blake, DW164, DW402 (LAGU, MO)
- Perymenium grande* Hemsl. var. *grande*, DW88 (LAGU, MO)
- Peteravenia schultzii* R.M. King & H. Rob., DW6, DW113, DW395 (B, K, LAGU, MO)
- Roldana petasioides* (Greenm.) H. Rob., DW85 (B, K, LAGU, MO)
- Sinclaria discolor* Hook. & Arn., DW12 (LAGU)
- Sinclaria sublobatum* H. Rob., DW15 (LAGU, MO)
- Sinclaria* sp., DW510 (LAGU)
- Sonchus oleraceus* L., DW229, DW295 (LAGU, MO)
- Stevia ovata* Willd., DW84, DW389 (B, K, LAGU, MO)
- Stevia tephrophylla* S.F. Blake, DW351 (LAGU)
- Synedrella nodiflora* (L.) Gaertn., DW90 (B, K, LAGU, MO)
- Tagetes filifolia* Lag., DW397 (LAGU)
- Tagetes tenuifolia* Cav., DW21, DW83 (B, LAGU, MO)
- Telanthophora arborescens* (Steetz) H. Rob. & Brettell, DW238 (B, LAGU, MO)
- Tithonia rotundifolia* (Mill.) S.F. Blake, DW187 (LAGU, MO)
- Tridax procumbens* L., DW216, DW430 (B, LAGU, MO)
- Trigonospermum annuum* McVaugh & Lask., DW203 (LAGU, MO)
- Verbesina* cf. *punctata* B.L. Rob. & Greenm., DW82 (LAGU)
- Verbesina* sp., DW367 (B, K, LAGU, MEXU, MO)
- Vernonia* cf. *deppeana* Less., DW263 (B, LAGU, MO)
- Vernonia leiocarpa* DC., DW9 (B, K, LAGU, MO)
- Vernonia patens* Kunth, DW114 (B, K, LAGU, MO)
- cf. *Vernonia* sp., DW517 (LAGU)
- Wedelia parviceps* S.F. Blake, DW23, DW157, DW249, DW420 (LAGU)
- \*\**Zinnia elegans* Jacq., DW251, DW399 (B, K, LAGU, MO)
- BEGONIACEAE**
- Begonia plebeja* Liebm., DW79 (LAGU)
- BIGNONIACEAE**
- \**Jacaranda mimosifolia* D. Don, DW550 (LAGU)
- Macfadyena unguis-cati* (L.) A.H. Gentry, DW435 (LAGU)
- Tabebuia* cf. *chrysantha* (Jacq.) G. Nicholson, ADESCAM
- Tabebuia rosea* (Bertol.) A. DC., DW260 (B, EAP, LAGU, MEXU, MO)
- Tecoma stans* (L.) Juss. ex Kunth, DW28, DW106 (LAGU, MO)
- BIXACEAE**
- †*Bixa orellana* L., ADESCAM
- BOMBACACEAE**
- Ceiba aesculifolia* (Kunth) Britt. & Baker f., MLRA
- Ceiba pentandra* (L.) Gaertn., DW576 (LAGU)
- BORAGINACEAE**
- Cordia alliodora* (Ruiz & Pav.) Oken, ADESCAM
- Cordia bullata* (L.) Roem. & Schult., DW296, DW400 (B, LAGU, MO)



*Cordia inermis* (Mill.) I.M. Johnst., DW426 (LAGU)  
*Heliotropium rufipilum* (Benth.) I.M. Johnst.,  
 DW259 (B, LAGU, MO)  
*Heliotropium* sp., DW124 (B, EAP, LAGU, MO)

#### BRASSICACEAE

*Lepidium virginicum* L., DW268, DW417 (LAGU,  
 MO)

#### BURSERACEAE

*Bursera simaruba* (L.) Sarg., DW445, AM3023 (BM,  
 LAGU)

#### CAMPANULACEAE

*Diastatea micrantha* (Kunth) McVaugh, DW8,  
 DW272, DW330 (B, LAGU, MO)  
*Lobelia laxiflora* Kunth, DW67, DW152 (LAGU)

#### CARICACEAE

*Carica cauliflora* Jacq., DW121 (LAGU)

#### CARYOPHYLLACEAE

*Arenaria lanuginosa* (Michx.) Rohrb., DW407  
 (LAGU, MO)  
*Drymaria cordata* (L.) Willd. ex Schult., DW213,  
 DW383 (B, LAGU, MO)  
*Stellaria ovata* Willd. ex Schldl., DW408 (LAGU,  
 MO)

#### CASUARINACEAE

\**Casuarina equisetifolia* L., DW621 (LAGU)

#### CECROPIACEAE

*Cecropia peltata* L., DW577 (LAGU)

#### CLETHRACEAE

*Clethra lanata* M. Martens & Galeotti, MLRA  
*Clethra mexicana* DC., DW143, DW438 (B, EAP,  
 LAGU, MO)

#### CLUSIACEAE

*Calophyllum brasiliense* (Standl.) Standl. var. *rekoii*,  
 DW524 (LAGU, MO)  
 cf. *Garcinia* sp., DW452 (LAGU)

#### COCHLOSPERMACEAE

*Cochlospermum vitifolium* (Willd.) Spreng.,  
 ADESCAM

#### CONVOLVULACEAE

*Ipomoea cholulensis* Kunth, DW154, DW158,  
 DW241 (LAGU, MO)  
*Ipomoea* cf. *mairetii* Choisy, DW208 (LAGU)  
*Ipomoea santae-rosae* Standl. & Steyerl., DW145  
 (LAGU)  
*Ipomoea squamosa* Choisy, DW177, DW350 (B,  
 LAGU, MO)

*Ipomoea* cf. *trifida* (Kunth) G. Don, DW47 (LAGU,  
 MO)

*Ipomoea umbraticola* House, DW44, DW227,  
 DW278 (B, LAGU, MO)

#### CUCURBITACEAE

*Cayaponia* sp., DW620 (LAGU)  
*Microsechium* sp., DW188 (LAGU, MO)  
*Rytidostylis ciliata* (Cogn) Kuntze, DW62, DW98  
 (LAGU)  
*Sechium edule* (Jacq.) Sw., DW  
*Sycios sertuliferus* Cogn., DW142 (LAGU, MO)

#### ERICACEAE

*Gaultheria erecta* Vent., DW437 (LAGU, MO)

#### EUPHORBIACEAE

*Acalypha macrostachya* Jacq., DW255 (B, LAGU,  
 MO)  
*Chamaesyce hirta* (L.) Millsp., DW324, DW511  
 (LAGU)  
*Croton xalapensis* Kunth, DW89 (B, F, LAGU, MO)  
*Euphorbia graminea* Jacq., DW172, DW498  
 (LAGU)  
*Euphorbia heterophylla* L., DW66 (B, K, LAGU, MO)  
 \**Euphorbia pulcherrima* Willd. ex Klotzsch,  
 ADESCAM  
 \**Ricinus communis* L., DW122 (LAGU)

#### FABACEAE

*Acacia hindsii* Benth., DW443 (LAGU)  
 \**Caesalpinia pulcherrima* (L.) Sw., DW80 (LAGU,  
 MO)  
 \**Cajanus cajan* (L.) Millsp., DW175 (LAGU)  
*Calliandra* sp., DW627 (LAGU)  
*Canavalia* sp., DW38 (K, LAGU, MO)  
 \**Cassia siamea* Lam., DW575 (LAGU)  
*Centrosema virginianum* (L.) Benth., DW210  
 (LAGU, MO)  
*Chamaecrista nictitans* (L.) Moench, DW239,  
 DW359 (LAGU)  
*Chamaecrista zygophylloides* (Britton & Rose) H.S.  
 Irwin & Barneby var. *deamii*, DW444 (LAGU)  
*Clitoria mexicana* Link, DW204 (LAGU)  
*Cologania* cf. *rufescens* Rose, DW181 (LAGU)  
*Coursetia caribaea* (Jacq.) Lavin, DW130 (LAGU,  
 MO)  
*Crotalaria mollicula* Kunth, DW138 (B, LAGU, MO)  
*Dalea cliffortiana* Willd., DW349 (B, LAGU, MO)  
*Dalea* sp., DW240 (LAGU)  
*Desmodium barbatum* (L.) Benth., DW342 (LAGU)  
*Desmodium cajanifolium* (Kunth) DC., DW447  
 (LAGU)



*Desmodium incanum* DC., DW406, DW414 (LAGU)

*Desmodium procumbens* (Schindl.) B.G. Schub. var. *longipes*, DW194 (B, K, LAGU, MO)

*Diphysa robinoides* Benth., DW520 (LAGU, MO)

*Erythrina berteriana* Urb., ADESCAM

*Hymenaea courbaril* L., ADESCAM

*Inga paterno* Harms, DW

*Inga pavoniana* G. Don, DW571 (LAGU)

*Inga punctata* Willd., DW523 (LAGU)

*Lonchocarpus rugosus* (Lundell) M. Sousa subsp. *apricus*, DW448, DW454 (LAGU, MO)

*Lysiloma* cf. *acapulcense* (Kunth) Benth., DW439 (B, LAGU, MEXU, MO)

*Macroptilium atropurpureum* (Moc. & Sessé ex DC.) Urb., DW273 (LAGU)

*Mimosa albida* Humb. & Bonpl. ex Willd., DW170 (B, K, LAGU, MO)

*Mimosa pudica* L., DW378 (LAGU)

*Phaseolus leptostachyus* Benth., DW169, DW214 (LAGU, MO)

*Phaseolus lunatus* L., DW3 (B, LAGU)

*Piscidia grandifolia* (Donn. Sm.) I.M. Johnst., DW469 (LAGU)

*Poiretia punctata* (Willd.) Desv., DW174 (LAGU, MO)

*Senna hirsuta* H.S. Irwin & Barneby var. *hirta*, DW372 (B, LAGU, MO)

*Spathodia campanulata* Beauv., DW

*Stylosanthes guianensis* (Aubl.) Sw., DW41, DW96 (B, K, LAGU, MO)

*Teramnus uncinatus* (L.) Sw., DW182 (LAGU)

*Vigna* sp., DW183 (LAGU)

*Zapoteca tetragona* (Willd.) H.M. Hern., DW135 (LAGU, MO)

*Zornia diphylla* (L.) Pers., DW171 (LAGU)

#### FAGACEAE

*Quercus sapotifolia* Liebm., DW144, MLRA1506 (B, K, LAGU, MO)

*Quercus* sp., DW97, DW269 (LAGU)

#### FLACOURTIACEAE

*Casearia sylvestris* Sw., DW467, DW451, MLRA1504 (B, LAGU, MEXU, MO)

*Prockia crucis* P. Br. ex L., DW375, AM3012 (B, BM, LAGU, MEXU, MO)

*Xylosma flexuosa* (Kunth) Hemsl., DW339 (LAGU)

#### GESNERIACEAE

*Achimenes erecta* (Lam.) H.P. Fuchs, DW394, DW492 (LAGU, MO)

*Achimenes longiflora* DC., DW329 (B, LAGU, MO)

*Achimenes misera* Lindl., DW344 (LAGU, MO)

*Achimenes pedunculata* Benth., DW63, DW365, DW374 (B, LAGU, MO)

*Phinaea repens* (Donn. Sm.) Soler., DW316 (B, LAGU, MO)

#### HERNANDACEAE

*Gyrocarpus americanus* Jacq., DW569 (LAGU)

#### HYDROPHYLLACEAE

*Wigandia urens* (Ruiz & Pav.) Kunth, DW223 (LAGU)

#### JUGLANDACEAE

*Juglans olanchana* Standl. & L.O. Williams, DW

#### LAMIACEAE

*Hyptis pectinata* (L.) Poit., DW45 (B, LAGU, MO)

*Hyptis suaveolens* (L.) Poit., DW94 (LAGU)

*Hyptis urticoides* Kunth, DW101, DW205 (B, LAGU, MO)

*Marsypianthes chamaedrys* (Vahl) Kuntze, DW370 (B, LAGU, MO)

*Salvia occidentalis* Sw., DW2, DW111, DW353 (B, K, LAGU, MO)

*Salvia polystachya* Ortega, DW110 (LAGU, MO)

*Salvia purpurea* Cav., DW270 (B, LAGU, MO)

\**Salvia splendens* Sellow ex Roem. & Schult., DW40 (B, K, LAGU, MO)

#### LAURACEAE

*Nectandra sinuata* Mez, DW538 (LAGU)

*Persea americana* Mill., ADESCAM

#### LOASACEAE

*Klaprothia fasciculata* (C. Presl.) Poston, DW332, DW524 (B, LAGU, MO)

*Metzelia* sp., DW358, DW376 (LAGU)

#### LOGANIACEAE

*Buddleja americana* L., DW266 (LAGU)

#### LORANTHACEAE

*Oryctanthus cordifolius* (C. Presl.) Urban, DW522 (LAGU)

#### MALPIGHIACEAE

*Byrsonima crassifolia* (L.) Kunth, ADESCAM

*Gaudichaudia albida* Cham. & Schltdl., DW93, DW168 (B, LAGU, MO)

*Tetrapteris schiedeana* Cham. & Schltdl., DW37, DW343, DW494, DW499 (LAGU)

*Stigmaphyllon ellipticum* (Kunth) A. Juss., DW33 (LAGU, MO)



**MALVACEAE**

- \**Hibiscus rosa-sinensis* L., DW236 (B, LAGU, MO)  
*Malvaviscus arboreus* Cav., DW75 (B, EAP, LAGU, MO, US)  
*Sida acuta* Burm. f., DW92 (B, LAGU, MO)  
*Sida glabra* Mill., DW34 (LAGU, MO)  
*Sida urens* L., DW72 (LAGU, MO)

**MELASTOMATACEAE**

- Conostegia xalapensis* (Bonpl.) D. Don ex DC., DW258, DW446, AM3001 (B, BM, LAGU, MO)  
*Heterocentron hondurensis* Gleason, DW95 (LAGU, MO)  
*Heterocentron glandulosum* var. *longicalyx* Whiffin, DW167 (LAGU)  
*Miconia argentea* (Sw.) DC., MLRA  
*Miconia guatemalensis* Cogn., DW369, DW468, AM3022 (B, BM, CAS, LAGU, MEXU, MO)  
*Miconia lauriformis* Naudin, DW196 (LAGU)  
*Monochaetum floribundum* (Schltdl.) Naudin, DW35 (B, CAS, LAGU, MO)  
*Pterolepis pumila* (Bonpl.) Cogn., DW102, DW325 (B, LAGU, MO)  
*Schwackaea cupheoides* (Benth.) Cogn., DW32 (LAGU)  
*Tibouchina longifolia* (Vahl) Baill., DW91, DW99 (LAGU)

**MELIACEAE**

- Cedrela odorata* L., DW392, DW474 (LAGU)  
*Cedrela tonduzii* C. DC., MLRA  
 \**Melia azedarach* L., DW  
*Trichilia havanensis* Jacq., DW64, DW371, AM3020 (BM, LAGU)  
*Trichilia hirta* L., DW257, AM3009 (BM, LAGU)  
*Trichilia tomentosa* Kunth, MLRA

**MENISPERMACEAE**

- Cissampelos pareira* L., DW509 (LAGU, MO)

**MORACEAE**

- Ficus goldmanii* Standl., DW211 (LAGU)  
*Ficus obtusifolia* Kunth, DW215, DW539 (LAGU)  
*Ficus ovalis* (Liebm.) Miq., DW163, DW166, DW405, DW409 (B, LAGU, MO)  
*Ficus pertusa* L. f., DW186 (B, F, LAGU, MO)

**MYRICACEAE**

- Myrica cerifera* L., DW31, DW440 (B, LAGU, MO)

**MYRSINACEAE**

- Ardisia compressa* Kunth, DW119, DW162 (LAGU, MO)

- Rapanea myricoides* (Schltdl.) Lundell, DW477 (LAGU)

**MYRTACEAE**

- Eugenia* cf. *acapulcensis* Steud., AM3003 (BM, LAGU)  
*Psidium guajava* L., MLRA  
*Psidium guineense* Sw., DW16, DW77, DW533 (LAGU, MO)  
*Psidium oerstedianum* O. Berg, MLRA

**NYCTAGINACEAE**

- \**Bougainvillea glabra* Choisy, DW235 (LAGU)  
*Mirabilis jalapa* L., DW161, DW253 (LAGU)  
 cf. *Mirabilis* sp., DW388 (LAGU)  
*Pisonia aculeata* L., DW265, DW336 (LAGU)

**OXALIDACEAE**

- Oxalis corniculata* L., DW505 (LAGU)  
*Oxalis debilis* (DC.) Lourteig var. *corymbosa*, DW622 (LAGU)  
*Oxalis frutescens* L., DW1, DW159, DW497, DW517 (B, F, LAGU, MO)

**PAPAVERACEAE**

- Bocconia frutescens* L., DW234 (LAGU)

**PASSIFLORACEAE**

- Passiflora ornithoura* Mast., DW49 (LAGU)

**PHYTOLACCACEAE**

- Phytolacca icosandra* L., DW160, DW418 (LAGU, MO)  
*Rivina humilis* L., DW13, DW107 (B, LAGU, MO)

**PIPERACEAE**

- Peperomia arboricola* C. DC., DW280 (LAGU, MO)  
*Peperomia granulosa* Trel., DW317 (LAGU, MO)  
*Peperomia deppeana* Schltdl. & Cham., DW279 (LAGU, MO)  
*Peperomia lanceolato-peltata* (C. DC.), DW531 (LAGU, MO)  
*Peperomia* cf. *liebmannii* C. DC., DW515 (F, LAGU, MO)  
*Peperomia* sp., DW184 (LAGU)  
*Piper amalago* L., DW456, DW458, DW462, DW466 (LAGU, MO)  
*Piper hispidum* Sw., DW473, DW464 (LAGU, MO)  
*Piper Jacquemontianum* Kunth, DW304, DW485 (LAGU)  
*Piper marginatum* Jacq., DW475, DW486 (LAGU)  
*Piper umbellatum* L., DW461, DW474 (LAGU)



**POLEMONIACEAE**

*Loeselia glandulosa* (Cav.) G. Don, DW7, DW73, DW507 (B, LAGU, MO)

**POLYGALACEAE**

*Polygala hondurana* Chodat, DW48, DW320 (LAGU)

*Polygala longicaulis* Kunth, DW393, DW525 (LAGU, MO)

*Polygala paniculata* L., DW225, DW398, DW493 (LAGU)

*Polygala* sp., DW189 (LAGU)

**PORTULACACEAE**

*Talinum paniculatum* (Jacq.) Gaertn., DW618 (LAGU)

**PROTEACEAE**

*Roupala glaberrima* Pittier, DW470 (LAGU)

**RHAMNACEAE**

*Colubrina reclinata* (L'Her.) Brongn., DW570 (LAGU)

**ROSACEAE**

\**Eriobotrya japonica* (Thunb.) Lindl., DW

*Prunus brachybotrya* Zucc., MLRA1505, AM3013 (BM, LAGU)

*Rubus irasuensis* Liebm., DW449, DW476 (LAGU, MO)

\**Rubus niveus* Thunb., DW481 (B, LAGU, MO)

**RUBIACEAE**

*Borreria* cf. *latifolia* (Aubl.) K. Schum., DW362 (LAGU)

*Borreria ocymoides* (Burm. f.) DC., DW201, DW218, DW232 (B, F, LAGU, MO)

*Bouvardia leiantha* Benth., DW276, DW480, DW484 (B, LAGU, MO)

\**Coffea arabica* L., DW460 (LAGU)

\**Coffea liberica* W. Bull ex Hiern, DW

*Crusea longiflora* (Willd. ex Roem. & Schult.) W.R. Anderson, DW495 (LAGU)

*Hamelia patens* Jacq., DW233, DW464 (B, LAGU, MO)

*Hoffmannia angustifolia* Standl., AM3002 (BM, LAGU)

*Manettia reclinata* L., DW192 (LAGU)

*Mitracarpus villosus* (Sw.) Cham. & Schltldl., DW22, DW533, DW534 (LAGU, MO)

*Psychotria pubescens* Sw., DW366 (LAGU, MEXU, MO)

*Richardia scabra* L., DW30 (LAGU, MO)

**RUTACEAE**

*Casimiroa edulis* La Llave & Lex., DW197 (B, LAGU, MO)

\**Citrus limetta* Risso, ADESCAM

\**Citrus sinensis* (L.) Osbeck, DW

*Zanthoxylum* cf. *culantrillo* Kunth, ADESCAM

**SAPINDACEAE**

*Sapindus saponaria* L., DW457 (LAGU)

**SAPOTACEAE**

*Sideroxylon persimile* (Hemsl.) T.D. Penn., DW242, AM3018 (BM, LAGU, MO)

**SCROPHULARIACEAE**

*Castilleja arvensis* Schltldl. & Cham., DW104 (B, BKL, F, LAGU, MO)

*Russelia sarmentosa* Jacq., DW275, DW506 (LAGU)

**SOLANACEAE**

*Brachistus stramoniifolius* (Kunth) Miers, DW528 (B, LAGU, MO)

*Cestrum lanatum* M. Martens & Galeotti, DW432 (LAGU)

*Physalis pubescens* L., DW529, DW530 (B, LAGU, MO)

*Solanum lanceifolium* Jacq., DW513, DW521 (LAGU, MO)

*Solanum nigrum* var. *americanum* (Mill.) O.E. Schulz, DW147 (LAGU)

*Solanum torvum* Sw., DW473 (LAGU)

**STERCULIACEAE**

*Waltheria glomerata* C. Presl., DW198 (LAGU)

*Waltheria indica* L., DW36, DW198 (LAGU, MO)

**STYRACACEAE**

*Styrax argenteus* C. Presl., DW411 (B, LAGU, MO)

**TILIACEAE**

*Heliocarpus mexicanus* (Turcz.) Sprague, DW479 (B, EAP, LAGU, MEXU, MO)

*Triumfetta speciosa* Seem., DW202 (LAGU)

*Triumfetta bogotensis* DC., DW478 (LAGU)

**ULMACEAE**

*Trema micrantha* (L.) Blume, ADESCAM

*Ulmus mexicana* (Leibm.) Planch, DW

**URTICACEAE**

*Boehmeria caudata* Sw., DW24, DW482, AM3011 (B, BM, LAGU, MO)

*Myriocarpa longipes* Liebm., DW483 (LAGU, MO)

*Pilea hyalina* Fenzl., DW319 (LAGU)



*Urera* cf. *baccifera* (L.) Gaudich., AM3016 (BM, LAGU)

*Urera caracasana* (Jacq.) Grisebach., DW396, DW489, DW490 (LAGU)

#### VALERIANACEAE

*Valeriana scandens* (Gardn.) K.A.E. Muell. var. *candolleana*, DW224, DW245 (LAGU, MO)

#### VERBENACEAE

*Cornutia pyramidata* L., DW368, DW416 (LAGU, MO)

*Citharexylum donnell-smithii* Greenm., DW10, DW29, DW429 (B, EAP, LAGU, MO)

*Lantana camara* L., DW156 (B, EAP, LAGU, MO)

*Lippia myriocephala* Schlttdl. & Cham., DW472 (B, EAP, LAGU, MEXU, MO)

#### VITACEAE

*Cissus erosa* Rich., DW624 (LAGU)

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